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EXAMINER

CAMPOS, YAIMA

ART UNIT PAPER NUMBER

2185

DATE MAILED: 12/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/811,856

Applicant(s)

NAKANO ET AL.

Examiner

Yaima Campos

Art Unit

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/30/04 and 8/4/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. The instant application having Application No. 10/811,856 has a total of 20 claims pending in the application; there are 5 independent claims and 15 dependent claims, all of which are ready for examination by the examiner.

#### **I. INFORMATION CONCERNING OATH/DECLARATION**

##### **Oath/Declaration**

2. The applicant's oath/declaration has been reviewed by the examiner and is found to conform to the requirements prescribed in 37 C.F.R. 1.63.

#### **II. STATUS OF CLAIM FOR PRIORITY IN THE APPLICATION**

As required by M.P.E.P. 201.14(c), acknowledgement is made of applicant's claim for priority based on an application filed on January 30, 2004 (Foreign Priority 2004-022873).

#### **III. INFORMATION CONCERNING DRAWINGS**

##### **Drawings**

3. The applicant's drawings submitted are acceptable for examination purposes.

#### **IV. ACKNOWLEDGEMENT OF REFERENCES CITED BY APPLICANT**

4. As required by M.P.E.P. 609(C), the applicant's submissions of the Information Disclosure Statements dated March 30, 2004 and August 4, 2005 are acknowledged by the examiner and the cited references have been considered in the examination of the claims now

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pending. As required by M.P.E.P 609 C(2), a copy of the PTOL-1449 initialed and dated by the examiner is attached to the instant office action.

**V. OBJECTIONS TO THE SPECIFICATION**

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: -- **Storage System Comprising Memory Allocation Based on Area Size, Using Period and Usage History** --.

**VI. REJECTIONS BASED ON PRIOR ART**

**Claim Rejections - 35 USC § 103**

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 1-3 and 10-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wollrath et al. (US 6,519,615) in view of Tremaine (US 6,851,030).

8. As per **claim 1**, Wollrath discloses “an area assigning method in a storage management system for managing a storage device for storing data,” as it is explained that [**“the invention generally relates to data processing systems, and more particularly, to leasing storage in data processing systems” (Column 2, lines 35-37)**] “comprising the steps of: holding management information for managing the storage device,” [**With respect to this limitation, Wollrath discloses that “method invocation (MI) component” contains “reference**

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**component 605” for each reference monitored as a way holding management information of storage locations (Column 9, lines 19-22)] “area assignment information for managing an area assigning state of the storage device,” [With respect to this limitation, Wollrath discloses that “each resource has a unique *handle* by which the resource can be referenced. The handle may be implemented in various ways, such as an address, array index, unique value, pointer, etc.” (Column 2, lines 54-57)]. Wollrath discloses a form of keeping “history information” to decided whether a requested area can be assigned as it is taught that [“The server call processor determines the appropriate grant period based on a number of conditions including the amount of resource required and the number of other grant periods previously granted for the same resource” (Column 7, lines 32-35)]. Wollrath further discloses “receiving an assignment request for temporarily using an area in association with designation of an area size and a using period; determining whether or not the requested area can be assigned at the using period which is requested for assignment; and assigning a size designated by the request, the using period, and the area when the area can be assigned as a result of the determination.” [With respect to this limitation, Wollrath discloses that “The method comprises the steps of receiving a request from a caller specifying a storage location and a lease period, determining a lease period during which the caller has access to the specified storage locations, advising the caller of the granted lease period, and permitting the caller to access storage location for the determined lease period” (Columns 4-5, lines 63-67 and 1-2)].**

Wollrath does not disclose expressly the use of “history information for managing a history of area assuring and release and obtaining transition of a used amount of a storage by referring to the history upon receiving an assignment request.”

Tremaine discloses the use of “history information for managing a history of area assuring and release and obtaining transition of a used amount of a storage by referring to the history upon receiving an assignment request.” [Tremaine discloses “**a method and structure for balancing associative resources allocation with respect to load, wherein said resources are allocated/deallocated to requesting processes or *agents* based on their reference history and demand**” (Abstract, lines 1-5). Tremaine also discloses that “**the invention records a usage history for each of the partitions and reallocates the distribution of the resources within each of the partitions as a function of the usage history**” (Column 2, lines 56-59); further specifies that “**the recording of the usage history maintains a count for each partition of how frequently resources within the partition are accessed**” (Column 2, lines 62-65) and also teaches that “**as the buffers are used, the invention tracks the buffer usage within each partition to determine whether the partitions are being underallocated or overallocated buffers. More specifically, the invention tracks buffer usage by maintaining the partition counter that provides a history of which partitions regularly use their buffers and which partitions do not regularly use their buffers**” (Column 6, lines 34-40)].

(US 6,519,615) by Wollrath et al. and (US 6,851,030) by Tremaine are analogous art because they are form the same field of endeavor of computer memory allocation/deallocation.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the memory allocation/deallocation wherein resources are

allocated/deallocated in response to requests as described by Wollrath, further include a feature that considers memory usage history to decided how to allocate/deallocate resources as described by Tremaine.

The motivation for doing so would have been because Tremaine teaches that [**“the invention makes the system more efficient and allows all agents equal access to as many buffers as can be made available depending upon the agents needs and usage histories” (Column 7, lines 32-35); comments that “the invention desires to preclude agents from monopolizing a buffer resource” and also specifies that “the invention desires to provide buffer reallocation when needed, without retrying requests or waiting for periodic re-allocations” (Column 1, lines 59-62)].**

Therefore, it would have been obvious to combine (US 6,851,030) by Tremaine with (US 6,519,615) by Wollrath et al. for the benefit of creating a system/method to optimize the allocation/deallocation of computer memory resources to obtain the invention as specified in claim 1.

9. As per **claims 2 and 3**, the combination of Wollrath and Tremaine discloses “the area assigning method according to Claim 1,” [See rejection to claim 1 above] “further comprising the steps of: obtaining a necessary area size and a necessary using period upon executing processing for temporarily using the storage;” [With respect to this limitation, Wollrath discloses a “Lease period algorithm to determine the lease period that should be granted” for a certain storage location and explains that the “lease period algorithm” also considers the “size of the storage locations”(Column 16, lines 9-11 and 13-19). Wollrath also teaches that “the groups of storage locations may have many programs vying for access” (Column

**12, lines 20-30)] “requesting assignment of the area which is temporarily used for storage management;” [With respect to this limitation, Wollrath discloses that “a program (the client) requests a lease from the file system manager (the server) to access the group of storage locations for a period of time (the lease period)” (Column 12, lines 33-37); and further specifies that “it is immaterial to the leasing of storage locations what kind of data is contained in the storage locations” (Column 12, 21-22); that “the leasing of storage locations can be applied on different levels of storage, such as database fields, files, blocks of storage, or actual storage locations” (Column 12, lines 23-26) as disclosing that the allocation of storage resources may be done for any kind of processing, including storage management]“and executing processing by using the area assigned for the storage management and requesting release of the area which is not necessary after completing the processing” [With respect to this limitation, Wollrath discloses that “when an application in the distributed processing system no longer requires a reference to a resource, it informs the MI component managing the resource for that reference so that the resource may be reclaimed for reuse” (Column 7, lines 55-59)]. The memory allocation/deallocation method as described by Wollrath encompasses any kind of program requesting memory resources to a memory manager; therefore, Wollrath discloses memory allocation/deallocation for “database reediting processing,” as described by applicant.**

In addition, Tremaine discloses that [**“the invention is readily applicable to efficient dynamic management of other associative resources within a data processing system” (Column 4, lines 3-4)] as a way of specifying that memory allocation/deallocation may be done**



in response to any kind of storage management processing, such as “database reediting” as claimed by Applicant.

10. As per claims 10, 12 and 14, Wollrath discloses “an area management method in a storage management system for managing a storage device for storing data;” as it disclosed that **[“the invention generally relates to data processing systems, and more particularly, to leasing storage in data processing systems” (Column 2, lines 35-37)]**. This method, as described by Wollrath encompasses any kind of program requesting memory resources to a memory manager; therefore, Wollrath discloses memory allocation/deallocation for “database reediting processing,” as described by applicant. **[With respect to this limitation, Wollrath discloses that “a program (the client) requests a lease from the file system manager (the server) to access the group of storage locations for a period of time (the lease period)” (Column 12, lines 33-37); and further specifies that “it is immaterial to the leasing of storage locations what kind of data is contained in the storage locations” (Column 12, 21-22); that “the leasing of storage locations can be applied on different levels of storage, such as database fields, files, blocks of storage, or actual storage locations” (Column 12, lines 23-26) as disclosing that the allocation of storage locations may be done for any kind of processing, including storage management] “holding management information which manages the storage device,” [With respect to this limitation, Wollrath discloses that “method invocation (MI) component” contains “reference component 605” for each reference monitored as a way holding management information of storage devices (Column 9, lines 19-22)] “area assignment information which manages an area assignment state of the storage device,” [With**

respect to this limitation, Wollrath discloses that “each resource has a unique *handle* by which the resource can be referenced. The handle may be implemented in various ways, such as an address, array index, unique value, pointer, etc.” (Column 2, lines 54-57)].

Wollrath discloses a form of keeping “history information” to decide whether a requested area can be assigned as it is taught that [“The server call processor determines the appropriate grant period based on a number of conditions including the amount of resource required and the number of other grant periods previously granted for the same resource” (Column 7, lines 32-35)]. Wollrath further discloses “obtaining a size of a work area necessary for reediting and an execution time of the reediting processing upon executing the reediting processing of a database by a database management system; designating an area size and a using period and requesting assignment for temporary use of an area to the storage management system;” [With respect to this limitation, Wollrath discloses a “Lease period algorithm to determine the lease period that should be granted” for a certain storage location and explains that the “lease period algorithm” also considers the “size of the storage locations”(Column 16, lines 9-11 and 13-19). Wollrath also teaches that “the groups of storage locations may have many programs vying for access” (Column 12, lines 20-30)] “when the assignment is requested, determining whether or not the requested area can be assigned” [With respect to this limitation, Wollrath discloses “receiving a request from a caller specifying a storage location and a lease period, determining a lease period during which the caller has access to the specified storage locations” (Column 4, lines 64-67). Wollrath also specifies that “depending on the availability, priority, and other factors, the server either denies the request or grants a lease period. The lease period granted may be

**either the entire lease period requested or some portion of it” (Column 12, lines 38-42)]**

“assigning an area with the designated size at the designated period when the area can be assigned as a result of the determination; and setting, as the work area, the area assigned by the storage management system and executing the reediting of the storage management database”

**[With respect to this limitation, Wollrath discloses that “once the client receives a lease period, the client may access the group of storage locations for the lease period” (Column 12, lines 42-43) and “when an application in the distributed processing system no longer requires a reference to a resource, it informs the MI component managing the resource for that reference so that the resource may be reclaimed for reuse” (Column 7, lines 55-59)].**

Wollrath also discloses a method equivalent to “monitoring the using period of the assigned area after assigning a temporarily-used area in the storage management system; and calculating an excess of an area use charge when it is over the using period as result of the monitoring” as **[“the application call processor monitors the application’s use of the reference and, either when the application explicitly informs the application call processor that the reference is no longer required or when the application call processor makes this determination on its own, the application call processor sends a clean call to the managing MI (method invocation) component” and further specifies that “Subsequently, the application call processor eliminates the reference from a list of references being used by the application” (Columns 6-7, lines 63-67 and 1-7)].**

Wollrath does not disclose expressly the use of “history information for managing a history of area assuring and release and obtaining transition of a used amount of a storage by referring to the history upon receiving an assignment request.”

Tremaine discloses the use of “history information for managing a history of area assuring and release and obtaining transition of a used amount of a storage by referring to the history upon receiving an assignment request.” [Tremaine discloses “**a method and structure for balancing associative resources allocation with respect to load, wherein said resources are allocated/deallocated to requesting processes or *agents* based on their reference history and demand**” (Abstract, lines 1-5). Tremaine also discloses that “**the invention records a usage history for each of the partitions and reallocates the distribution of the resources within each of the partitions as a function of the usage history**” (Column 2, lines 56-59); further specifies that “**the recording of the usage history maintains a count for each partition of how frequently resources within the partition are accessed**” (Column 2, lines 62-65) and also teaches that “**as the buffers are used, the invention tracks the buffer usage within each partition to determine whether the partitions are being underallocated or overallocated buffers. More specifically, the invention tracks buffer usage by maintaining the partition counter that provides a history of which partitions regularly use their buffers and which partitions do not regularly use their buffers**” (Column 6, lines 34-40)]. In addition, Tremaine discloses that [“**the invention is readily applicable to efficient dynamic management of other associative resources within a data processing system**” (Column 4, lines 3-4)] as a way of specifying that memory allocation/deallocation may be done in response to any kind of storage management processing, such as “database reediting” as claimed by Applicant.

(US 6,519,615) by Wollrath et al. and (US 6,851,030) by Tremaine are analogous art because they are form the same field of endeavor of computer memory allocation/deallocation.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the memory allocation/deallocation wherein resources are allocated/deallocated in response to requests as described by Wollrath, further include a feature that considers memory usage history to decided how to allocate/deallocate resources as described by Tremaine.

The motivation for doing so would have been because Tremaine teaches that [**“the invention makes the system more efficient and allows all agents equal access to as many buffers as can be made available depending upon the agents needs and usage histories” (Column 7, lines 32-35); comments that “the invention desires to preclude agents from monopolizing a buffer resource” and also specifies that “the invention desires to provide buffer reallocation when needed, without retrying requests or waiting for periodic re-allocations” (Column 1, lines 59-62)].**

Therefore, it would have been obvious to combine (US 6,851,030) by Tremaine with (US 6,519,615) by Wollrath et al. for the benefit of creating a system/method to optimize the allocation/deallocation of computer memory resources to obtain the invention as specified in claims 10, 12 and 14.

11. As per **claim 11**, the combination of Wollrath and Tremaine discloses “the database reediting processing method according to Claim 10,” [See rejection to claim 10 above] “further comprising the steps of: requesting, to the storage management system release of an area which is unnecessary after executing the reediting processing;” [With respect to this limitation, Wollrath discloses that “when an application in the distributed processing system no longer requires a reference to a resource, it informs the MI component managing the resource for

**that reference so that the resource may be reclaimed for reuse” (Column 7, lines 55-59)]**

Wollrath also discloses recording information on the release as when **[the resource is released, “the application call processor eliminates the reference from a list of references being used by the application” (Column 7, lines 5-7)]**. Tremaine discloses “recording information on the release to the history information upon releasing the area” as **[“a small *partition reference* counter is employed for each partition to record its usage history” (Column 2, lines 11-13)]**.

12. As per **claim 13**, the combination of Wollrath and Tremaine discloses “the area management method according to Claim 12,” **[See rejection to claim 12 above]** “further comprising the steps of: obtaining transition of a used amount of a storage based on the history information in the determining step; and determining whether or not the designated area can be assigned at the designated period based on the transition of the used amount of the storage” **[With respect to this limitation, Tremaine discloses an equivalent system including “a method and structure for balancing associative resources allocation with respect to load, wherein said resources are allocated/deallocated to requesting processes or *agents* based on their reference history and demand” (Abstract, lines 1-5). Tremaine also discloses that “the invention records a usage history for each of the partitions and reallocates the distribution of the resources within each of the partitions as a function of the usage history” (Column 2, lines 56-59); further specifies that “the recording of the usage history maintains a count for each partition of how frequently resources within the partition are accessed” (Column 2, lines 62-65) and also teaches that “as the buffers are used, the invention tracks the buffer usage within each partition to determine whether the partitions are being underallocated or overallocated buffers. More specifically, the invention tracks buffer usage by**

**maintaining the partition counter that provides a history of which partitions regularly use their buffers and which partitions do not regularly use their buffers” (Column 6, lines 34-40)].**

13. As per **claim 15**, the combination of Wollrath and Tremaine discloses “the area management method according to Claim 14,” [See rejection to claim 14 above] “wherein in order to calculate the excess, the storage management system comprises an account table for managing a user name and a using period of the storage device” [With respect to this limitation, Wollrath discloses that “MI component 600 can include a reference component 605 for each reference monitored” (Figure 6 and Column 9, lines 19-20) and that “reference component 605 preferably constitutes a table or comparable data structure with reference data portions 610, reference count 620, and grant period register 630” (Figure 6 and Column 9, lines 23-25)] “and a charge table for registering at least of an excess for temporary assignment on the storage device” [With respect to this limitation, Wollrath discloses that once a memory resource is released, “the application call processor eliminates the reference from a list of references being used by the application” (Columns 6-7, lines 63-67 and 1-7) and that “grant period register 630” is used to “determine when to initiate garbage collector 660 to reclaim the corresponding resource” (Column 9, lines 25-29)].

14. As per **claim 16**, the combination of Wollrath and Tremaine discloses “a program having a function for executing the method according to Claim 1” [See rejection to claim 1 above]. Wollrath further specifies that [“the MI component” of the disclosed invention “may consist of a number of software modules” (Column 5, lines 63-65)].

15. As per **claim 17**, claim 17 requires “a main memory for holding management information for managing the storage device, area assignment information for managing an area assignment state of the storage device, and history information for managing a history on area assuring and release” (*Figure 2 and page 7, lines 24-25 of applicant’s specification defines the means as main memory 03*) [Wollrath teaches this limitation as “Memory 750, 850 and 950” (Figures 7, 8 and 9). Tremaine further teaches this limitation as “Virtual Channel SRAM main memory 203 and 303 having buffers” (Figures 2 and 3)]; “processing means for assigning an area of the storage device to the application in accordance with the management information and the area assignment information,” (*Figure 2 and Page 10, line 2 of applicant’s specification defines the means as CPU 202*) [Wollrath teaches this limitation as “MI component 600 including modules such as Application call processor 640, server call processor 650” and explains that Application call processor determines a “grant period” for every memory allocation request (Figure 6, Column 9, lines 19-22, and Column 7, lines 29-30). Tremaine further teaches this limitation as “Processing system 200 having one or more processors 201” (Figure 2 and Column 4, lines 5-6)]; “calculating means for obtaining transition of a used amount of a storage by referring to the history information upon receiving an assignment request for temporarily using an area in association with designation of an area size and a using period;” (*Figure 1, Page 12, lines 24-25 and Pages 13-14, lines 18-25 and 1-15 of applicant’s specification defines assign area 101 in storage management system 100 and area management history109*) [Tremaine discloses this limitation as “the invention records a usage history for each of the partitions and reallocates the distribution of the resources within each of the partitions as a function of the usage history” (Column 2, lines 56-59);



further specifies that “the recording of the usage history maintains a count for each partition of how frequently resources within the partition are accessed” (Column 2, lines 62-65)]; “ means for determining whether or not a requested area can be assigned at the using period for the assignment request based on the transition of the used amount of the storage;” (*Figure 1 and Page 12, lines 24-25 of applicant’s specification defines the means as assign area 101 in storage management system*) [Wollrath discloses this limitation as “Lease period algorithm to determine the lease period that should be granted” for a certain storage location and explains that the “lease period algorithm” also considers the “size of the storage locations”(Column 16, lines 9-11 and 13-19). Tremaine further discloses “resources allocation with respect to load, wherein said resources are allocated/deallocated to requesting processes or *agents* based on their reference history and demand” (Abstract, lines 1-5) and also specifies that “the invention tracks buffer usage by maintaining the partition counter that provides a history of which partitions regularly use their buffers and which partitions do not regularly use their buffers” (Column 6, lines 34-40)]. “and assigning means for assigning a size and a using period designated by the request and an area when the area can be assigned as a result of the determination” (*Page 9, line 5 of applicant’s specification defines the means as “programs which execute assign area 101”*) [Wollrath discloses this limitation as “the MI component” of the disclosed invention “may consist of a number of software modules” (Column 5, lines 63-65)].

16. As per claim 18, Wollrath discloses a memory allocation/deallocation system wherein a “main memory further holds a table of a temporarily-assigned area list which stores a user name to which the area is assigned, an area name, an assignment size, and a using period” [With

respect to this limitation, Wollrath discloses that “method invocation (MI) component” contains “reference component 605” for each reference monitored as a way holding management information of storage devices (Column 9, lines 19-22) and that “each resource has a unique *handle* by which the resource can be referenced. The handle may be implemented in various ways, such as an address, array index, unique value, pointer, etc.” Wollrath further specifies that “MI component 600 can include a reference component 605 for each reference monitored” (Figure 6 and Column 9, lines 19-20) and that “reference component 605 preferably constitutes a table or comparable data structure with reference data portions 610, reference count 620, and grant period register 630” (Figure 6 and Column 9, lines 23-25)] (Column 2, lines 54-57)].

17. As per claims 19 and 20, claims 19 and 20 require means for “monitoring whether or not the assigned using period passes by referring to the table of the temporarily-assigned area list and returns a result of the monitoring by the monitoring means to a console terminal” and means for “calculating an excess of an area use charge by referring to the account table and the charge table (*Page 9, lines 5-6 of applicant’s specification defines the means as programs which execute monitor temporary area 103 and storage management 100 having functions of charge table 1803*) [Wollrath discloses this limitation as “the application call processor monitors the application’s use of the reference and, either when the application explicitly informs the application call processor that the reference is no longer required or when the application call processor makes this determination on its own, the application call processor sends a clean call to the managing MI (method invocation) component” and further specifies that

**“Subsequently, the application call processor eliminates the reference from a list of references being used by the application” (Columns 6-7, lines 63-67 and 1-7)]**

18. **Claims 4-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wollrath et al. (US 6,519,615) and Tremaine (US 6,851,030) as applied to claims 1-3 and 10-20 above, and further in view of Sankaranarayan et al. (US 6,799,208).

As per **claims 4-9**, the combination of Wollrath and Tremaine discloses a computer memory allocation/deallocation system/method according to the claimed invention as explained above, but fails to disclose expressly that the system/method includes an “area assignment reservation” for the requested resource, schedules “an execution date” for processing storage management, and provides a method to inquire the reservation state of memory resources.

Sankaranarayan discloses a computer memory allocation/deallocation system/method comprising an “area assignment reservation” for the requested resource, schedules “an execution date” for processing storage management, and provides a method to inquire the reservation state of memory resources. **[Sankaranarayan discloses a memory allocation/deallocation system in which “the architecture 2100 also includes a scheduler 2104 to schedule allocation of a set of the resources at a later time. The scheduler 2104 includes a calendar to track the time of day and date. The scheduler 2014 is configured to run *what if* scenarios to determine whether the resources controlled by the stateless resource providers 2102 will be available at selected times” (Figure 21 and Column 36, lines 47-54)].**

(US 6,519,615) by Wollrath et al., (US 6,851,030) by Tremaine and (US 6,799,208) by Sankaranarayan et al. are analogous art because they are form the same field of endeavor of computer memory allocation/deallocation.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the memory allocation/deallocation wherein resources are allocated/deallocated in response to requests described by Wollrath, include a feature that considers memory use history to decided how to allocate/deallocate resources as described by Tremaine, and further provide an “area assignment reservation” for the requested resource, scheduling of “an execution date” for processing storage management, and provide a method to inquire the reservation state of memory resources.

The motivation for doing so would have been because Sankaranarayan teaches that scheduling the allocation of memory resources to a reserved data and time [**“resolves a resource reservation conflict when the resource manager is unable to resolve a conflict based on current activity priorities” (Column 30, lines 19-24) and also that a “conflict resolution mechanism may be based on load balancing which attempts to maximize the number of activities that can proceed at any given time” (Column 8, lines 36-38)**]:

Therefore, it would have been obvious to combine (US 6,851,030) by Tremaine with (US 6,519,615) by Wollrath et al. and further with (US 6,799,208) by Sankaranarayan et al. for the benefit of creating a system/method to optimize the allocation/deallocation of computer memory resources to obtain the invention as specified in claims 4-9.

## **VII. RELEVANT ART CITED BY THE EXAMINER**

19. The following prior art made of record and not relied upon is cited to establish the level of skill in the applicant’s art and those arts considered reasonably pertinent to applicant’s disclosure. See **MPEP 707.05(c)**.

20. The following references teach computer memory allocation/deallocation using scheduling, history information or area size limitations.

**U.S. PATENT NUMBER**

US 6,523,102

US 6,076,151

US 5,604,900

US 5,367,637

US 6,785,793

US 2004/0068501

US 2004/019383

“Exploiting basic block value locality with block reuse,” by Jian Huang and Lilja, D.J.,

[www.ieeexplore.org](http://www.ieeexplore.org)

**VIII. CLOSING COMMENTS**

**Conclusion**

**a. STATUS OF CLAIMS IN THE APPLICATION**

21. The following is a summary of the treatment and status of all claims in the application as recommended by M.P.E.P. 707.07(i):

**a(1) CLAIMS REJECTED IN THE APPLICATION**

22. Per the instant office action, claims 1-20 have received a first action on the merits and are subject of a first action non-final.

**b. DIRECTION OF FUTURE CORRESPONDENCES**

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yaima Campos whose telephone number is (571) 272-1232 and email address is [Yaima.Campos@uspto.gov](mailto:Yaima.Campos@uspto.gov). The examiner can normally be reached on Monday to Friday 8:00 AM to 4:30 PM.

**IMPORTANT NOTE**

24. If attempts to reach the above noted Examiner by telephone or email are unsuccessful, the Examiner's supervisor, Mr. Donald Sparks, can be reached at the following telephone number: Area Code (571) 272-4201.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

November 18, 2005

  
DONALD SPARKS  
SUPERVISORY PATENT EXAMINER

Yaima Campos  
Examiner  
Art Unit 2185